Being Active in Online Communications: Firm Responsiveness and Customer Engagement Behaviour

Abstract

This research investigates the behavioural effects of firms' online activeness in influencing customer engagement in word-of-mouth communications. Using a large-scale field dataset of hotel reviews and managerial responses, this study empirically examines firm responsiveness in relationship to community members' participation in the online review posting. Novel findings are reported that response volume and speed are important for effecting firm–customer interactions. This highlights a firm-leading influence on customers' word-of-mouth behaviour by identifying firm engagement as a motivational driver of customer engagement. It offers implications for researchers and practitioners with regard to social media marketing, in particular firm engaging in the online communication network by acting in an active and prompt manner.

Keywords: online managerial responses; customer reviews; customer engagement behaviour; firm engagement; social media marketing

1. Introduction

Supported by Web 2.0 (O'Reilly, 2007), information creation and exchange in social media are increasingly common in the digital world (Kaplan & Haenlein, 2010). In this participatory environment, many more customers are willing to participate in the online communications to share their experiences with firms and other members of the community. Such interactive activities take place in various forms, including blogging, word-of-mouth communications, writing reviews, and recommendations (Van Doorn et al., 2010). The massive content customers write can be a useful information source for firms (Kozinets, 2002) in developing and improving businesses' dynamic marketing capabilities (Barrales-Molina et al., 2014). More importantly, engaged customers become online word-of-mouth advertisers for businesses, and this imposes a profound impact on the deeper level of firm–customer relationships and long-term business performance.

The power of sharing is determined by the breadth and depth of customer engagement, which has become an essential feature of businesses. For example, the volume of user-generated content (UGC) for a product/service or the number of users in an online brand community serves as an indicator of a brand's or a product/service's popularity (Proserpio & Zervas, 2017). Such popularity may attract wider attention, potentially leading to increased recognition and sales (Tirunillai & Tellis, 2012), according to the social influence network theory (Friedkin, 1998). This theory posits that the social influence created by online traffic and the propagated information in a social network is pervasive in shaping individuals' attitudes, cognition and behaviour (Iyengar et al., 2011; Kurt et al., 2011). Management researchers regard such social influence among fellow consumers as one of the primary factors affecting consumers' choices of products (e.g., Kurt et al., 2011; Wang et al., 2013), purchase intentions (e.g., Fang et al., 2013; Zhang et al., 2014), perception (e.g., Cheng & Ho,

2015; Lee et al., 2015), and online communication behaviour (e.g., Goes et al., 2014; Sridhar & Srinivasan, 2012; Zhang et al., 2011). A wider scope of customer engagement can amplify the crowd's voice on the internet and hence strengthen the social influence, with a greater number of customers acting and participating in the network (King et al., 2014).

The substantial influence of customer engagement on business performance calls for marketers to expand network scale to acquire market knowledge, competing for a portion of public attention, improving online reputation, retaining and satisfying customers and creating synergistic effects (Chang et al., 2015). To encourage customers to voice their opinions, companies are now acting in social media. For instance, many firms initiate and manage fan pages on social networking sites to breed online brand community. The virtual online community in the computer-mediated social gathering context fosters customers' engagement in the network (Shriver et al., 2013), leading to increased trust and network effects of the social influences on connected people reciprocally (Fang et al., 2013; Shoham et al., 2017). In addition to interactions among community members, we also observe purposeful marketing posts by firms and a growing number of online firm–customer conversations such as chatting with customers and responding to customers' online posts on review platforms or discussion forums. Marketing researchers and practitioners have recognised that social media are becoming a desired and efficient channel connecting consumer and marketers (Schniederjans et al., 2013; Hollebeek et al., 2014). It is useful for disseminating information and engaging customers, through which companies impose influence on customers' behaviour (Evans, 2010).

Given the business impact of customer engagement and thus the importance of business strategy to encourage customer engagement behaviour via social media, the key question that motivates this study is that "To what extent can businesses' social media effort affect

customer engagement behaviour?". A review of the literature does not give a clear answer. This question is first concerned with the antecedents of customer engagement, for which prior studies primarily focus on the customer, firm or context specific factors (Van Doorn et al., 2010). King et al. (2014) illustrate that in the current body of knowledge of the antecedents of electronic word-of-mouth (eWOM) participation, there is a need to know how firms can foster reviews and reviewers. In particular, little is known about whether firm engagement in social media activities, in other words, the firm–customer interaction, is also a motivational driver for customer engagement in eWOM. Further, this question is also of high practical relevance. Research on firms' strategic use of online social sites is in an early stage (Goh et al., 2013), with current efforts devoted to debating whether to engage in social media activities and evaluating their economic value. However, little attention has been paid to the efficacy of firms' social media efforts in affecting customer engagement rather than purchase behaviour (Lamberton & Stephen, 2016). Discussion is also lacking on business online activeness after strategic regime change (i.e., adoption of social media strategy) and how such activeness continuously impacts customers' engagement behaviour.

The aim of this research is to empirically investigate the behavioural value of businesses being responsive online in stimulating customers' engagement in the eWOM communications. Specifically, this paper studies online managerial responses to customer reviews and whether and how businesses' responsiveness affects community members' participation in the online review posting. Using review and response data of 1,024 London hotels over a 15-year period, this research considers online managerial response characteristics (e.g., volume, speed, length) and tests these instruments in relation to the number of customer reviews posted on the online review platform.

The findings demonstrate that customers' engagement in writing online reviews, in addition to individual specific determinants (see Hennig-Thurau et al., 2004), is also influenced by businesses' responsiveness in the online interactions. This adds to our knowledge about engagement by identifying firm engagement as an additional driver for customer engagement behaviour. This research also provides insights to the social media marketing literature. By investigating the implicit intervening process in influencing consumers' mindsets (Srinivasan et al., 2010), this research discovers factors that influence online responsiveness and further review volume. It emphasises business activeness in social media activities and the continuity and consistency of relevant practices to encourage more customers to engage in online communications.

The article proceeds as follows. It first presents an overview of relevant literature and discusses the theoretical basis for hypothesising the influence of managerial responsiveness on customer engagement. The data and sample selection are described in the next section. Then the tests of the cross-sectional and longitudinal effects of managerial responses are presented in the following section. Finally, the paper is concluded with a discussion of the research and managerial implications.

2. Social Media Marketing and Online Managerial Responses

In response to the social sense of business, marketers are gaining enthusiasm for capitalising on the social context and social influence for marketing activities (Yadav et al., 2013). Social media marketing is defined by Felix et al. (2017, p. 123) as "an interdisciplinary and cross-functional concept that uses social media (often in combination with other communications channels) to achieve organisational goals by creating value for stakeholders". Kozinets et al. (2010, p. 71) describe social media marketing as the "intentional influencing of consumer-to-consumer communications by professional marketing techniques". Social media marketing

takes many forms, such as initiating fan pages on social networking sites and responding to customers' comments on review platforms.

Current literature on social media marketing efforts and effectiveness mainly focuses on economic outcomes. Previous studies have documented that marketers play a persuasive role in social media, and marketer-generated content can affect customers' purchase behaviour (Goh et al., 2013). A positive association between social media marketing and purchase intention/expenditure (e.g., Kim & Ko, 2012; Kumar et al., 2016; Gong et al., 2017) results from the increased marketing capabilities built upon social media resources (Wang & Kim, 2017). Apart from driving revenue generation, such networking strategy is also powerful in brand management (Gensler et al., 2013). Godey et al. (2016) find that social media marketing favourably influences brand equity, especially brand awareness and brand image, as well as customers' behaviour towards the brand such as loyalty and preference. The creation and spread of firm-to-consumer social messages effectively enhance brand awareness, consideration and preference and attract new customers (De Vries et al., 2017).

In addition to exchange-related aspects, behavioural consequences of social media marketing efforts also are evident, particularly with regard to customers' engagement in online communications. Customer engagement is "a behavioural manifestation toward the brand or firm that goes beyond transactions" (Verhoef et al., 2010, p. 247), and "a multi-dimensional concept comprising relevant cognitive, emotional, and behavioural dimensions", varying in different contexts (Hollebeek et al., 2014, p. 152). Voluntary participation in social media can be both passive (i.e., reading the content generated by others) and active (i.e., creating content and sharing opinions) (Ashley & Tuten, 2015), which benefits the business, the brand and/or customers (Dong & Sivakumar, 2017). Incentives for customer engagement behaviour are multifaceted, involving customer-, firm- and context-related factors (Van Doorn et al.,

2010). The literature documents that firms may be motivational drivers for customer engagement, mainly stemming from brand characteristics, venue/channel support, information environment and incentive rewards (see Van Doorn et al., 2010). However, very few studies have paid attention to the firm–customer conversations and firm-generated content, and the findings of these studies are mixed (e.g., Kumar et al., 2013; De Vries et al., 2017). In fact, the social media marketing effort may also play a role in "chang[ing] customer engagement states—including their levels, intensities, and complexity" (Bolton, 2011, p. 273). Harmeling et al. (2017) define customer engagement marketing as "a firm's deliberate effort to motivate, empower, and measure a customer's voluntary contribution to the firm's marketing functions beyond the core, economic transaction" (p. 317). The objective of this marketing strategy is to motivate customers to actively participate and contribute to the marketing activities as "pseudo-marketers" (Harmeling et al., 2017, p. 312). Given the aim is to motivate customer engagement behaviour, it raises questions of how to motivate and how effective the strategy is. Nevertheless, little attention has been paid to firms' engagement in generating content in social media, and there is a lack of empirical evidence showing the effectiveness of firm–customer interactions on consumers' participation behaviour in online communications.

With respect to the nascent area of managerial responses to customer reviews, a handful of studies seem to suggest the potential impact of providing managerial responses on review volume. Ye et al. (2010) explore the impact of managerial responses on the volume of subsequent customer reviews. It applies a difference-in-difference approach to the customer review and management response data by matching hotels across two online review platforms. Comparing the volume of reviews before and after the first response, they find a positive impact of providing responses on review volume, but such influence diminishes if no further responses are provided. Using a similar cross-platform setting, Proserpio and Zervas

(2017) touch on the impact of management responses on review volume when they discuss the mechanism for response affecting review ratings. They find an increase in review volume—especially the number of positive reviews—after hotels start to respond. Chevalier et al. (2017) present similar findings, demonstrating that managerial responses can stimulate customers' reviewing activities, particularly critical reviews. Furthermore, by testing a panel model, Xie et al. (2016) find that managerial responses can lead to an increase in the volume of subsequent consumer reviews. They attribute the increased number of consumer word-of-mouth to the online firm–customer interactions.

3. Conceptual Framework and Hypotheses

The review of previous studies reveals two gaps in the literature. One is the inconclusive discussion on firm engagement in online communication in relation to customer engagement behaviour. The second gap is a lack of empirical investigation into firm responsiveness and its effectiveness in making behavioural effects in the online interactive network. Nevertheless, examining the efficacy of firms' social media efforts is important because of the public nature of managerial responses and thus the potential influence on other consumers and potential reviewers.[1] Therefore, this research focuses on business responsiveness in the review context and contends that observing managerial responses can be an additional driver for customers' engagement in eWOM activities.

A conceptual framework is proposed to depict the determinants of customer engagement behaviour (see Figure 1). It is argued that business responsiveness (measured by response

[1] In this study, the term 'potential reviewer' refers to existing customers who have not yet written reviews of their most recent service experience, regardless of whether they have written reviews before. Customers who have written multiple reviews for a hotel can be identified as returning customers. They may have strong preferences for the hotel and are more likely to write reviews, but this does not mean they will write reviews for the hotel again.

volume, speed and length), online popularity (i.e., the number of reviewers), and hotel characteristics that may affect service quality and customer satisfaction (e.g., star class, customer rating, chain brand, size, and age) are related to future review volume (i.e., the number of review posts in a future period).[2] In addition, the effects of business responsiveness can be potentially moderated by hotel specific factors.

Insert Figure 1 about here

Response volume

First, by responding to customer reviews, firms establish their social media presence in the online virtual community. This is an indicator of business adoption of social media strategy, which explicitly signals to customers that firms are willing to listen and interact (Proserpio & Zervas, 2017). In this case, customers' inferences about business trustworthiness are enhanced (Sparks et al., 2016). As a result, observing the firm–customer online interactions may inspire customers to voice with an expectation of that their opinions will be heard and responded to by the service provider (Gu & Ye, 2014); in other words, engagement is potentially strengthened (Higgins & Scholer, 2009). In particular, a higher volume of business-to-customer conversations presents a clearer behavioural manifestation of firm's responsiveness to customers' opinions. This leads to the following hypothesis:

Hypothesis 1: The volume of online managerial responses is positively associated with the future volume of customer reviews.

[2] The projection of the relationship between future review volume and responsiveness and between future review volume and online review popularity is based on the assumption that customers read the reviews and responses before deciding to write reviews, either before or after their consumption experience.

Response speed

The second factor is the speed of responding, measured by the average days between the date of the review posts and that of the associated responses. A shorter interval implies a faster responding speed. Service research has documented that timing and speed of response have a substantial influence in managing complaints and improving trust (e.g., Davidow, 2003; Homburg & Fürst, 2007; Sparks et al., 2016). In influencing customer engagement behaviour, the speed of responding performs a symbolic function (Enz & Grover, 1992), signalling that the firm is active in embracing and managing customers' comments. It indicates the firm is devoting efforts to maintaining an interactive relationship with their customers, which is an essential element of responsiveness. Moreover, response speed is critical to determine the position of response posts and hence its visibility and the attention it is able to attract from review readers (De Vries et al., 2012). Customer reviews are normally displayed on sites in reverse chronological order, with the most recent appearing first and each page only displaying a few posts. Many reviews are generated on the website every day, pushing older comments and the associated responses to later pages and making them less observable than those on the first few pages (De Vries et al., 2012), given the fact that customers hardly ever go beyond the first few pages (Pavlou & Dimoka, 2006). To compete with the rapid update of reviews, quicker responses increase the probability of responses being displayed and visible on the first few pages (Wang & Chaudhry, 2018) and thus influencing potential reviewers. It is reasonable to hypothesise:

Hypothesis 2: The speed of responding is positively associated with the future volume of customer reviews.

Response length

In addition, the content of conversations may provide incentives for expanded customer engagement. The online review-response establishes a communication channel connecting firms and customers and diffusing information (Felix et al., 2017). Management teams often acknowledge customers' word-of-mouth contribution, praise or distress, and promise to address the raised issues or sometimes offer offline benefits or compensation (Davidow, 2003). On the one hand, potential reviewers may be motivated to take advantage of the online and cost-effective medium with an expectation of their efforts being acknowledged, problems being solved, or additional benefits being offered (Gu & Ye, 2014). On the other hand, the functional and social benefits may also prompt consumers to engage in order to obtain information, establish an interpersonal relationship with firms, and fulfil a social need (Homburg et al., 2015; Buechel & Berger, 2018). Furthermore, marketer-generated content can be viewed as advertisements, and the content of such exogenous word-of-mouth (Godes & Mayzlin, 2009) with a deliberate attempt to market the product or service may raise public scrutiny. Customers may react to the authentic or exaggerated information supplied by firms in the online conversations to a greater extent, leading to a higher propensity to engage and speak out. The length of responses is considered as an indicator of the informational role of responses; therefore, it is hypothesised that:

Hypothesis 3: The length of online managerial response is positively associated with the future volume of customer reviews.

Firm characteristics

Furthermore, hotel specific factors may play a part in influencing the number of customer reviews and the magnitude of response effects. Responding hotels may be inherently better

managed and operated with quality service. These hotel-specific attributes could directly or indirectly contribute to the attractiveness of hotels in terms of offline guest visiting and online review writing, resulting in an increased or decreased number of online reviews. To measure hotels' managerial ability and service quality, star class (i.e., a hotel's star class on a five-star scale), customer ratings (i.e., a hotel's overall average review rating on a scale of 1 to 5), and chain brand (i.e., a hotel is a chain or an independent hotel) are considered. In addition, these hotel factors may moderate the response effect on review volume. For high-end, higher-rated and branded hotels, customers would usually expect a higher standard of service (Xie et al., 2016). Accordingly, customers' expectation of firms being attentive and responsiveness is potentially stronger, leading to an increased incentive to engage and interact with firms via the virtual platform. It is proposed that:

Hypothesis 4: The effects of responsiveness (response volume, speed and length) on future review volume is positively moderated by hotel characteristics (star, rating, chain).

4. Methods

4.1 Data and sample

This research explains online managerial responses in relation to review volume. Data on review and response of London hotels is collected from a leading travel site. London is chosen because it is a globally popular travel destination and a highly competitive market, which has an extensive number of hotels and reviews/responses that meet sampling and research needs. Information about all the formal hotels listed on the site at the time of data collection (including hotel identification, star class, and number of rooms) and the review and response history – including review date, review title and text, reviewer identification, response date, and response text – from the first review post of each hotel to the data entries at the time of data collection (i.e., early 2016) are downloaded. The raw dataset is cleaned for

the subsequent empirical analysis. First, hotels with zero reviews are removed (i.e., 26 hotels) as no observations of review and response are available to study the firm and customer engagement behaviour. Hotels that are closed at a later stage of the sample period are also excluded, leading to a loss of 13 more hotels. This is because it is hard to determine the causes of changes in online posting behaviour of both customers and service providers, which may bias the results. The final sample contains 1,024 hotels over an about 15-year period from January 2001 to February 2016. Although not all hotels in the sample appear on the site at the same time, the cut-off date for the review posts is the end of February 2016.

Table 1 describes the sample. Among the 1,024 hotels, 739 hotels (72.17%) have provided at least one response in the sample period. High-end hotels are most active in responding to online reviews (92.7% and 93.6% for the four-star and five-star class respectively). High customer-rated hotels (rating greater than or equal to 3) also actively engage in online managerial response, particularly those rated 4 or 4.5. Along the timeline, there is a clear upward trend in writing online reviews and responses (see Figure 2). The overall response ratio surges in the year 2009 and in general service providers respond to 45.93% of online customer reviews.

Insert Table 1 about here

Insert Figure 2 about here

In addition, Figure 3 presents the percentage of customer ratings on a scale of 1 to 5 for each year over the sample period. Overall, the tone of the collected comments tends to be positive. In particular, after the year 2009 when the response ratio started to accelerate, there is an

increase in the proportion of 5-score reviews while a decrease in that of 1- or 2-score reviews. Neutral reviews with a rating of 3 and 4 make up a relatively fixed percentage of the reviews over the years. This may reflect quality improvement in the hotel sector and possible changes in customer rating behaviour as a result of enhanced online firm–customer communications.

Insert Figure 3 about here

4.2 Variables and models

Data is organised at Hotel–Month level. Following the approach in earlier research (e.g., Duan et al., 2008; Gu and Ye, 2014; Xie et al., 2014), customer reviews and management responses in previous time periods are used to assess the influence on later customers, as the WOM effects often last for several weeks (Trusov et al., 2009; Xie et al., 2014). The dependent variable is a hotel's number of reviews in a calendar month (*ReviewVolume*), and the explanatory variables are the three variables of responsiveness (*ResponseVolume, ResponseDays,* and *ResponseLength*) in the previous month. Besides, as discussed in the previous section, hotels providing quality services may naturally attract more consumers to stay, potentially leading to a higher volume of reviews, and these hotels are more likely to provide managerial responses in a professional way, leading to a higher level of responsiveness. Therefore, five hotel-specific factors—*Star, Rating, Chain, Size, and Age*—are included to control for hotel-level heterogeneity (see Table 2 for a detailed description of variables).[3] To control for time effect, a time dummy for each month is also included to

[3] The value of these variables is at a fixed time point (i.e., the time point of data collection), but these attributes are not strictly time-invariant (e.g., star class upgrade/downgrade, size expansion, brand acquisition etc.). The purpose of including these variables in the model is to account for differences among sampled hotels in these aspects.

account for time trend of review and response behaviour that is common to all hotels.

Considering that the data on monthly review and response is clustered at the hotel level, a multilevel model (two-level model) is adopted, with the review/response at the first level and the hotel as the second level indicator. The random effects model estimates the group effects and group level predictors at the same time. Furthermore, there might be time effects and such time effects may vary across individual hotels. Hence, the time factor (i.e., month) is included at the group level to allow for random slopes across different hotels. The model is specified as:

$$ReviewVolume_{ht} = \delta_1 Responsiveness_{ht-1} + \gamma_1 Firm_h + \tau_h + u_{0h} + u_{ht} + e_{ht}$$

where *Responsiveness* is tested with three response variables, including *ResponseVolume, Responsedays, and ResponseLength.* The dependent variable and the response variables are at monthly level (taking the logarithmic values), and variables of *Responsiveness* are one month lagged; $Firm_h$ is a vector of hotel specific factors—*Star, Rating,* and *Chain*; τ_i includes other hotel factors, *Size* and *Age* (taking the logarithmic values), and time dummies; u_{0h} and u_{ht} capture the random effects of hotel h and time t and e_{ht} are observation-level residuals. Multicollinearity is not a concern for the variables of interest given the low VIFs compared to the common threshold (see Table 2).

Insert Table 2 about here

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5. Results

5.1 Model-free evidence

A two-sample t-test is conducted to determine if there is any significant difference in daily

review volume (measured as the daily number of reviews each hotel receives during the period of its presence on the website) between responding and non-responding hotels. Table 3 shows that responding hotels on average receive 0.452 online reviews per day (equivalent to 13.748 reviews per month and 164.976 reviews per year), while non-responding hotels have an average daily review number of 0.065 (equivalent to 1.977 per month and 23.725 per year). The difference between the two groups is statistically and practically significant ($p < 0.001$). Such significant difference exists between responding and non-responding hotels at each star class except for five-star hotels ($p = 0.137$). The model-free evidence suggests that review volume of responding hotels is significantly larger than non-responding hotels.

Insert Table 3 about here

5.2 Main results

Estimations results for responsiveness are presented in Table 4 Columns 1–3. First, as expected in the first hypothesis, response volume is positively associated with review volume ($\beta = 0.092$, $p < 0.001$). It means a 10% increase in the number of responses relates to 0.92% increase in the number of reviews in the next period. Second, *ResponseDays* is negatively associated with review volume ($\beta = -0.033$, $p < 0.001$). For example, a 10% decrease in the monthly average time intervals (days) between reviews and the associated responses from the service provider leads to about 0.33% increase in the review volume in the following month. This suggests that response speed has a positive impact on review volume, which supports hypothesis number two. Moreover, the third hypothesis of response length is also supported given the result showing its positive association with review volume ($\beta = 0.023$, $p = 0.038$). It implies a 10% increase in the word counts of responses is linked with 0.23% increase in the

future review volume. These findings together support presumptions about the positive effect of responsiveness on future review volume.

In addition, the results show that review volume is largely affected by former reviewers in terms of how they rate the service. As shown in Table 4, the average customer ratings of hotels established online are positively related to future review volume. Approximately, a 1 score increase in the average ratings may lead to an over 20% increase in the next period's review volume. This implies the significance of the crowd effect on customer engagement behaviour. Besides, a positive relationship between hotel size and review volume and a negative relationship between hotel age and review volume are detected. Furthermore, the results show there is no significant effect of star class and chain brand on review volume. With regard to the moderating effects of hotel specific factors (i.e., *Star*, *Rating*, *Chain*) on the response effect, the estimation results in column 4–6 of Table 4 show no evidence to support hypothesis 4, which is in contrast to the prediction.

Insert Table 4 about here

5.3 Additional tests

Several additional tests are conducted to check the robustness of the results. First, it is worth pointing out that the time dummies are significant after the year 2009. This is in line with the growing trend in reviewing and responding behaviour starting from that date. To further check the robustness, all data before the year 2009 is eliminated. The remaining data in the period 2009–2016 is used to re-estimate the multilevel model. The estimations (Table 5 Panel A) confirm the main results that response volume is positively associated with review volume ($\beta = 0.089$, $p < 0.001$) and response days are negatively associated with review volume (β = -

0.032, $p < 0.001$), and there is no evidence showing that hotel factors can moderate response effects on review volume. However, in contrast to the based result, response length has no statistically significant influence ($\beta = 0.016$, $p = 0.149$).

Insert Table 5 about here

Next, the data includes some repeat reviewers who have multiple reviews for the same hotel. Godes and Mayzlin (2009) demonstrate that the effects of firm-generated messages in the word-of-mouth marketing campaign vary with the degree of customer loyalty. Their findings suggest that exogenous word-of-mouth created by firms is more impactful and raises awareness among less loyal customers because they are less informed than loyal customers, who have already formed strong ties and opinions about the firm. Gu and Ye (2014) also hint that there might be a self-selection issue among returning customers who are more likely to write reviews. The information distortion derived from individual preference may affect the decision-making process (Chaxel & Han, 2018). Therefore, we can exclude the reviews written by returning customers (i.e., a customer writes more than two reviews of the same hotel in the sample period) to check the sensitivity of results to customers' heterogeneous preference. Panel B of Table 5 shows that the results are robust to measuring one-time reviewers, except for response length ($\beta = 0.015$, $p = 0.175$). The response volume remains significantly positive ($\beta = 0.092$, $p < 0.001$), and response days present a negative relationship ($\beta = -0.034$, $p < 0.001$).

In addition, as presented in Panel C of Table 5, the investigation focuses on the responding hotels only after they start to respond. A subsample is created only keeping review observations of responding hotels after the date of each responding hotel's first managerial response. The subsample includes 692 hotels, 642,501 customer reviews, and 358,752

managerial responses from March 2004 to February 2016. Estimations are very similar to the baseline results. The indicators of responsiveness retain a significant and positive relationship with the review volume in the following period (*ResponseVolume*, $\beta = 0.085$, $p = 0.001$; *ResponseDays*, $\beta = -0.029$, $p < 0.001$; *ResponseLength*, $\beta = 0.019$, $p = 0.095$). These effects are not moderated by hotel specific factors.

Finally, in the main test, data is organised at the monthly level and the results may be sensitive to the choice of the time window. To rule out this possibility, the model is estimated respectively using a weekly and quarterly time window (not reported in the table). Consistent with the baseline random effect estimations, results show that the number of responses is positively associated with future review volume. Response days are negatively related to review volume, suggesting a positive effect of response speed on future review volume. But there is no evidence supporting the relationship between response length and review volume and the moderating effects of hotel factors.

6. Discussions and Conclusions

6.1 Summary of findings and theoretical implications

This study examines online firm and customer engagement issue by studying the behavioural effect of managerial responses on customer reviews. The sampled data presents a fact that responding firms have a larger number of daily review volume compared to non-responding hotels. This provides extra evidence to prior studies (e.g., Ye et al., 2010; Proserpio & Zervas, 2017; Chevalier et al., 2017) which discover a positive relationship between providing online managerial responses and customer review volume. Further, in testing the multilevel random effect model, it is found that business responsiveness has a strong relation with future review volume. In particular, the empirical results show a significant and positive influence of response volume on future review volume, which is in line with the conclusion in Xie et al.

(2016). Besides, a novel finding in this research is that response speed is a strong indicator of firm responsiveness which positively influences customers' participation in writing comments. This echoes the significance of timing in the service recovery literature (e.g., Davidow, 2003; Homburg & Fürst, 2007; Sparks et al., 2016); but instead of accentuating the effect on low-satisfaction consumers, this research highlights the promptness of responses to all potential reviewers. These findings support the first two hypotheses, implying that responding frequently and quickly can lead to an increase in the number of reviews in the longer term.

In addition, inconsistent with the hypothesis number three, there is limited evidence showing the significance of response length in relation to future review volume. Different from the expectation of an informational role of responses, the empirical evidence suggests that the possible effect on review engagement is trivial. Besides, no evidence is documented to support the last hypothesis. Although some hotel specific factors play a role in shaping the likelihood of customers' review engagement, they cannot moderate the impact of responsiveness on review volume. This implies that online responsiveness is critical notwithstanding the level, type and capability of firms.

Altogether, these findings suggest that customers' engagement intention and behaviour are influenced by firms' engagement in the online conversations. This contributes to the engagement literature (e.g., Eisingerich et al., 2015; Mathwick & Mosteller, 2017; Pansari & Kumar, 2017; Van Doorn et al., 2010) by determining that firm engagement is a motivational driver of customer engagement behaviour. Apart from self-motivation for word-of-mouth sharing (Berger, 2014), there is a spill over effect of the managerial intervention on reviewing behaviour of the community members. A business being responsive and active on the social media can facilitate interactions between customers and firms, which can attract, encourage

and stimulate online users, especially potential reviewers, to engage in online reviewing and communications. This research also contributes to the marketing research in relation to social media efforts by investigating the effect of online firm-generated messages that has been understudied in the current literature (Harmeling et al., 2017; Kumar et al., 2016). Prior studies tend to estimate response effects before and after the policy change rather than the long-term effect. It remains unclear what the key factors are that affect firm responsiveness and hence how it exerts an influence on customers' engagement in writing reviews. Studying the behavioural effects of firm responsiveness in an online review context suggests that firms' strategic participation in online communications can potentially create leading influence and draw wider attention, which makes it an effective tool to enhance online popularity and social influence.

6.2 Implications for practice

These discussions clearly show that firms' online responsiveness can stimulate customer engagement behaviour in eWOM communications. The business's strategic and voluntary exposure on online social sites can help gain customers' attention, expand the consumer network, manage customers, and enhance social influence and online popularity, all potentially leading to favourable outcomes. This requires firms to make strategic changes with "committing to long-term paths or trajectories of competence development" (Teece et al., 1997, p. 529). For firms that have not established an online presence in the network, providing managerial responses would be an option to kick-start engagement in online firm-customer communications and active management of their social media presence. For firms that have adopted social media to implement marketing activities, it is important to keep the engagement and communication as a consistent practice. Businesses should respond in a faster and frequent way to make sure the managerial effort is manifest to customers.

Especially when a firm receives a large number of reviews in a certain period, it is important to compete with the review update speed. Responding quickly and frequently increases the possibility of responses being displayed on the first few pages and thus being easier for review readers and potential reviewers to see, leading to an enhanced power in influencing the propensity for customer engagement. The continuous and positive impact of firm responsiveness creates strategic value for managing customers and potentially for financial outcomes.

6.3 Limitations and future research

A few limitations should be acknowledged. First, this study focuses on online popularity as demonstrated by the number of customer reviews. It does not consider offline popularity, such as the actual number of visitors, and its potential influence on the review volume. Future research may extend this study by examining the relationship between offline and online popularity and the possible impact of managerial response on sales/revenue generation. Second, the included control variables of hotel characteristics are not exhaustive. Additional variables such as price, location, and unobservable attributes (e.g., improvements to hotels' managerial expertise and service quality) can be added to the model to assess the offline popularity and dynamics. Third, the research setting to investigate the business social media presence and activeness in this study is an online community-based review platform. This is a third-party organised communication channel, which may present some policy-related issues that impede or affect how firms engage. Furthermore, the review-response communication is less firm-initiated. It would be interesting to examine the interplay between firm engagement and customer engagement behaviour by using "firm-initiated marketing communication in its official social media pages" (Kumar et al., 2016, p. 7), given that the corporate resources allocated to managing the channels are different (Ashley & Tuten, 2015).

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Figures

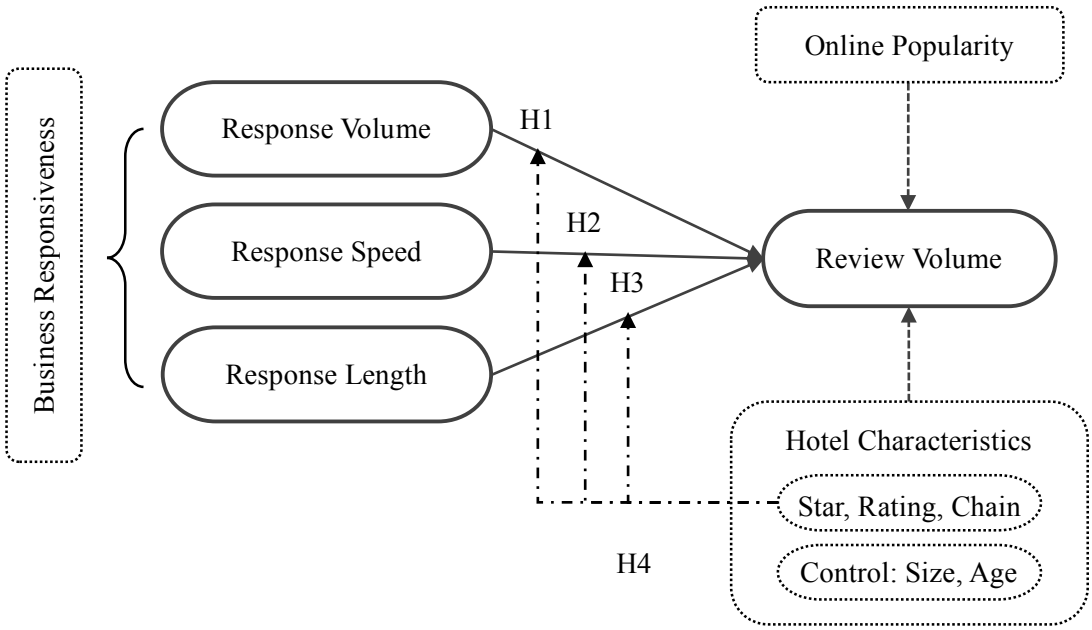
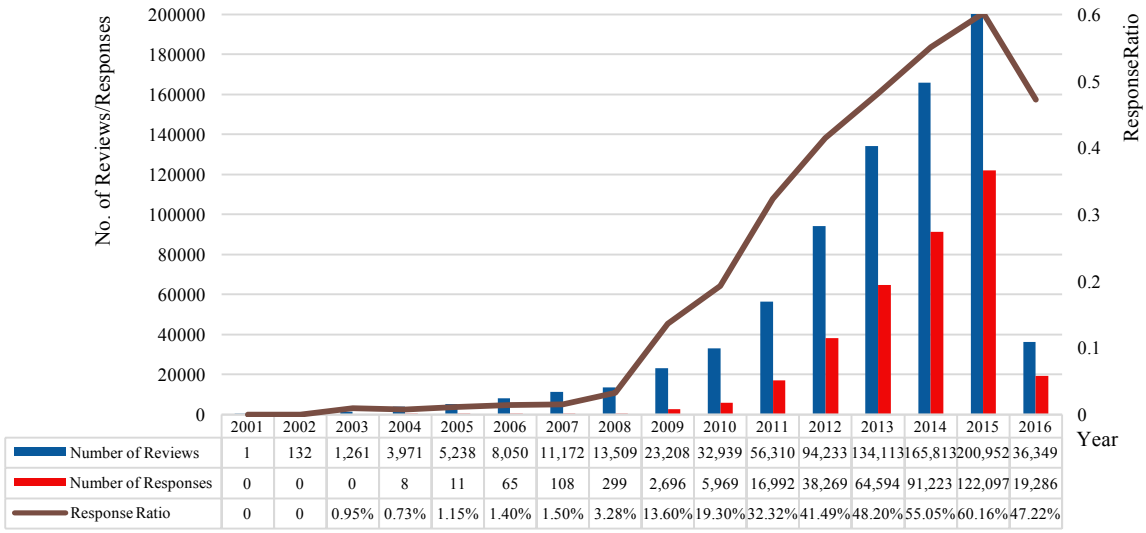


Figure 1. Research framework



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of Reviews	1	132	1,261	3,971	5,238	8,050	11,172	13,509	23,208	32,939	56,310	94,233	134,113	165,813	200,952	36,349
Number of Responses	0	0	0	8	11	65	108	299	2,696	5,969	16,992	38,269	64,594	91,223	122,097	19,286
Response Ratio	0	0	0.95%	0.73%	1.15%	1.40%	1.50%	3.28%	13.60%	19.30%	32.32%	41.49%	48.20%	55.05%	60.16%	47.22%

Note: The year of review and the year of its associated response may be different. Yearly distribution of response ratio is based on the year when the reviews were posted. The drop of review/response number in 2016 is due to data availability. The data was collected in March 2016 and refined to the period before the end of February 2016.

Figure 2. Number of reviews and responses

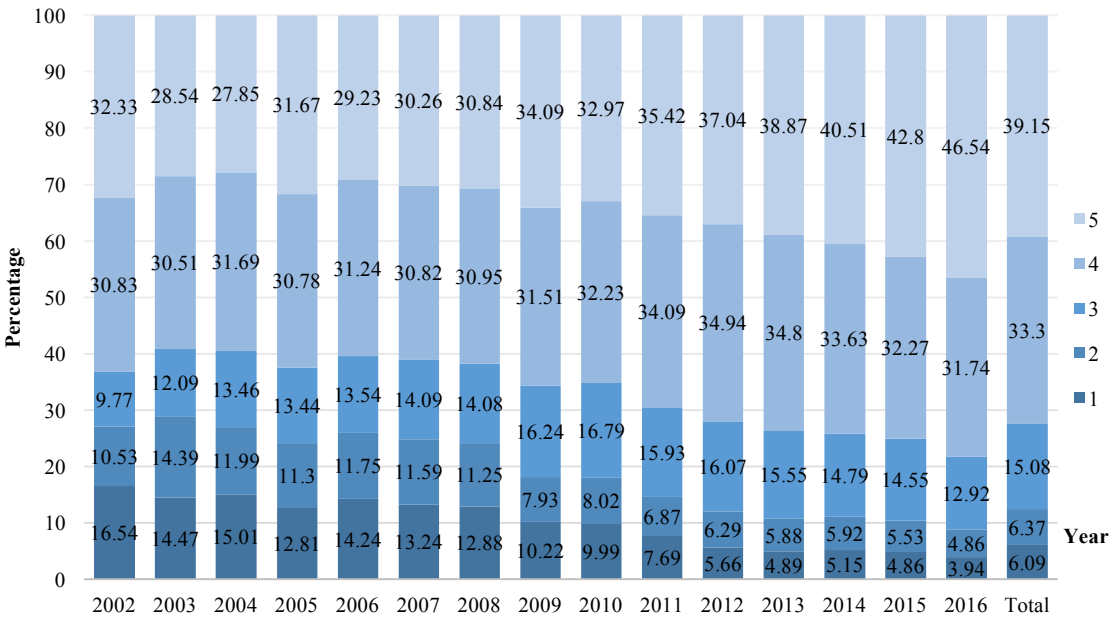


Figure 3. Distribution of ratings over time

Tables

Table 1. Descriptive statistics

Star class	Number of hotels	Number of responding hotels	Rating	Number of hotels	Number of responding hotels
5	110	103 (93.64%)	5	44	29 (65.91%)
4/4.5	274	254 (92.70%)	4/4.5	506	445 (87.94%)
3/3.5	361	282 (78.12%)	3/3.5	289	199 (68.86%)
2/2.5	133	67 (50.38%)	2/2.5	154	60 (38.96%)
0/1/1.5	146	33 (22.60%)	1/1.5	31	6 (19.35%)
Total	1024	739 (72.17%)	Total	1024	739 (72.17%)

Note: The null value of star class is due to unavailability of this information on the review website. Rating is the overall customer-rated score, which is round to the nearest .5.

Table 2. Summary statistics

Variables	Description	N	Mean	SD	VIF
$ReviewVolume_{ht}$	The logarithm of hotel *h*'s number of reviews in period *t*	76,329	1.567	1.215	2.630
$ResponseVolume_{ht-1}$	The logarithm of hotel *h*'s number of responses in period *t-1*	23,847	2.029	1.223	1.890
$ResponseDays_{ht-1}$	The logarithm of hotel *h*'s average number of days between responses and the associated reviews in period *t-1*	23,845	2.131	1.239	1.130
$ResponseLength_{ht-1}$	The logarithm of hotel *h*'s average word count of responses in period *t-1*	23,582	4.385	0.496	1.050
$Star_h$	Hotel *h*'s star class on a five-star scale	76,329	3.323	1.133	1.550
$Rating_h$	Hotel *h*'s overall average customer review ratings on a scale of 1 to 5	76,329	3.646	0.796	1.410
$Chain_h$	An indicator variable, which takes the value of 1 if hotel *h* is a chain hotel and takes the value of 0 if hotel *h* is an independent hotel	76,329	0.265	0.441	1.310
$Size_h$	The logarithm of hotel *h*'s number of rooms	75,849	4.283	1.037	1.910
Age_h	The duration of presence on the website, measured by the logarithm of days from the date of hotel *h*'s first review to the cut-off date	76,328	8.197	0.451	1.120

Note: *ReviewVolume, ResponseVolume, ResponseDays, ResponseLength, Size* and *Age* take logarithmic values. *ResponseVolume, ResponseDays, ResponseLength* are one month lagged.

Table 3. T-test for review volume between responding and non-responding hotels

		$Response_{ihv-1}=0$		$Response_{ihv-1}=1$		t-test
Variable	Conditions	M	SD	M	SD	t-value
$DailyReviewVolume_h$		0.065	0.120	0.452	0.575	-11.250***
	Star = 0/1/1.5	0.033	0.117	0.255	0.287	-6.620***
	Star = 2/2.5	0.065	0.055	0.242	0.353	-4.037***
	Star = 3/3.5	0.096	0.127	0.358	0.534	-4.314***
	Star = 4/4.5	0.079	0.133	0.600	0.635	-3.656***
	Star = 5	0.193	0.263	0.542	0.612	-1.497

Note: *Response* is an indicator variable, demonstrating whether a hotel provides managerial responses, which takes the value of 1 if hotel *h* has provided at least one online response in the sample period. *DailyReviewVolume* is measured as the daily number of reviews in the duration of hotel presence on the site. *Star* is the hotel star class. *Rating* is the overall average customer review rating. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Effects of responsiveness on review volume

$ReviewVolume_{ht}$	(1)	(2)	(3)	(4)	(5)	(6)
Fixed effects						
$ResponseVolume_{ht-1}$	0.092***			0.071		
	(0.006)			(0.044)		
$ResponseDays_{ht-1}$		-0.033***			-0.002	
		(0.004)			(0.027)	
$ResponseLength_{ht-1}$			0.023**			-0.006
			(0.011)			(0.075)
$Star_h$	-0.049	-0.045	-0.050	-0.053	-0.022	0.034
	(0.045)	(0.049)	(0.050)	(0.045)	(0.052)	(0.094)
$Rating_h$	0.238***	0.239***	0.265***	0.240***	0.244***	0.126
	(0.065)	(0.072)	(0.073)	(0.066)	(0.075)	(0.130)
$Chain_h$	-0.157*	-0.120	-0.127	-0.157*	-0.131	0.183
	(0.084)	(0.092)	(0.092)	(0.084)	(0.094)	(0.143)
$Size_h$	0.546***	0.546***	0.556***	0.547***	0.545***	0.559***
	(0.044)	(0.049)	(0.049)	(0.044)	(0.049)	(0.049)
Age_h	-0.147***	-0.159***	-0.157***	-0.148***	-0.160***	-0.159***
	(0.042)	(0.048)	(0.047)	(0.042)	(0.048)	(0.047)
$Responsiveness_{ht-1} \times Star_h$				0.012	-0.007	-0.019
				(0.008)	(0.005)	(0.016)
$Responsiveness_{ht-1} \times Rating_h$				-0.006	-0.001	0.030
				(0.012)	(0.008)	(0.023)
$Responsiveness_{ht-1} \times Chain_h$				0.006	0.003	-0.070***
				(0.012)	(0.008)	(0.024)
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes

Intercept	-1.949***	-1.717***	-2.186***	-1.931***	-1.790***	-2.026***
	(0.460)	(0.516)	(0.521)	(0.456)	(0.519)	(0.615)
Random effect variances						
Hotel level	0.666***	0.833***	0.823***	0.661***	0.836***	0.816***
	(0.103)	(0.118)	(0.118)	(0.104)	(0.118)	(0.117)
Month time effect	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Monthly review/response level	0.165***	0.166***	0.167***	0.165***	0.166***	0.167***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
N	23676	23674	23413	23676	23674	23413
Log-likelihood	-14268.984	-14461.145	-14319.342	-14266.224	-14458.027	-14310.178

Note: The three independent variables of responsiveness are one month lagged. *ReviewVolume, ResponseVolume, ResponseDays, ResponseLength, Size* and *Age* take logarithmic values. The variable of responsiveness in the interaction terms for column 4, 5, 6 is *ResponseVolume*, *ResponseDays*, and *ResponseLength* respectively. The multilevel models present maximum likelihood estimations. All estimations have robust error terms clustered at the hotel level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5. Robustness checks

$ReviewVolume_{ht}$	Panel A: After the year 2009			Panel B: One-time reviewer			Panel C: After responding		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fixed effects									
$ResponseVolume_{ht-1}$	0.089***			0.092***			0.085***		
	(0.006)			(0.006)			(0.006)		
$ResponseDays_{ht-1}$		-0.032***			-0.034***			-0.029***	
		(0.004)			(0.004)			(0.004)	
$ResponseLength_{ht-1}$			0.016			0.015			0.019*
			(0.011)			(0.011)			(0.011)
$Star_h$	-0.050	-0.042	-0.046	-0.052	-0.046	-0.049	-0.103**	-0.102**	-0.102**
	(0.048)	(0.053)	(0.053)	(0.044)	(0.048)	(0.049)	(0.046)	(0.050)	(0.051)
$Rating_h$	0.289***	0.299***	0.318***	0.244***	0.241***	0.252***	0.383***	0.411***	0.415***
	(0.070)	(0.077)	(0.077)	(0.067)	(0.074)	(0.076)	(0.061)	(0.067)	(0.067)
$Chain_h$	-0.139	-0.096	-0.105	-0.137*	-0.101	-0.098	-0.091	-0.048	-0.050
	(0.086)	(0.094)	(0.093)	(0.081)	(0.089)	(0.089)	(0.077)	(0.084)	(0.084)
$Size_h$	0.570***	0.573***	0.582***	0.537***	0.537***	0.540***	0.585***	0.595***	0.597***
	(0.046)	(0.051)	(0.050)	(0.042)	(0.047)	(0.048)	(0.042)	(0.046)	(0.046)

Age_h	-0.140***	-0.150***	-0.149***	-0.153***	-0.169***	-0.166***	0.127***	0.173***	0.165***
	(0.043)	(0.048)	(0.048)	(0.041)	(0.046)	(0.047)	(0.045)	(0.049)	(0.050)
Time dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-1.540***	-1.489***	-1.705***	-1.796***	-1.501***	-1.869***	-3.412***	-3.788***	-3.907***
	(0.481)	(0.534)	(0.532)	(0.453)	(0.510)	(0.523)	(0.400)	(0.436)	(0.448)
Random effect variances									
Hotel level	0.720***	0.888***	0.877***	0.605***	0.762***	0.780***	0.592***	0.717***	0.718***
	(0.123)	(0.135)	(0.134)	(0.099)	(0.112)	(0.117)	(0.078)	(0.088)	(0.089)
Month time effect	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Monthly review/response level	0.163***	0.164***	0.164***	0.171***	0.172***	0.172***	0.159***	0.160***	0.160***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
N	23317	23315	23059	23556	23553	23285	22857	22854	22644
Log-likelihood	-13894.957	-14074.261	-13937.817	-14519.572	-14699.255	-14556.196	-13287.823	-13456.337	-13358.066

Note: The three independent variables of responsiveness are one month lagged. *ReviewVolume, ResponseVolume, ResponseDays, ResponseLength, Size* and *Age* take logarithmic values. The variable of responsiveness in the interaction terms for column 4, 5, 6 is *ResponseVolume*, *ResponseDays*, and *ResponseLength* respectively. The multilevel models present maximum likelihood estimations. All estimations have robust error terms clustered at the hotel level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$